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JEFFER, MANGELS, BUTLER & MARMARO, LLP 1900 AVENUE OF THE STARS, 7TH FLOOR LOS ANGELES, CA 90067				LUONG, VINH
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/785,026

Filing Date: February 15, 2001

Appellant(s): Yoshihide ITEYA

**MAILED**

JUN 20 2006

Brennan C. Swain  
For Appellant

**GROUP 3600**

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed April 25, 2006 appealing from the Office action mailed May 27, 2005.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal: Application No. 10654357 as listed by Appellant.

**(3) Status of claims**

The statement of the status of the claims contained in the brief is correct.

**(4) Status of Amendments after Final**

The Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of claimed subject matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of rejection to be reviewed on appeal**

The Appellant's statement of the grounds of rejection to be reviewed on appeal in the brief is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

The following is a listing of the evidence relied upon in the rejection of claims under appeal.

6,073,730	Abe	Jun. 13, 2000 <sup>1</sup>
JP 2000-268953	Seimitsu	Sep. 29, 2000
JP 4-48521	Miyoshi et al.	Feb. 18, 1992
5,745,438	Hill et al.	Apr. 28, 1998
5,370,412	Chou	Dec. 6, 1994

The English translation of Seimitsu and Miyoshi is attached as an Appendix to the Examiner's Answer.

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<sup>1</sup> The US Patent 6,073,730 issued to Abe was filed on April 9, 1998.

**(9) Grounds of rejection**

The following grounds of rejection are applicable to the appealed claims:

- (1) Claims 1 and 3-27 are rejected under 35 USC 112, first paragraph. This rejection is set forth on page 2 of the final Office Action on May 27, 2005.
- (2) Claims 1 and 3-27 are rejected under 35 USC 112, second paragraph. This rejection is set forth on page 2 of the final Office Action.
- (3) Claims 1, 3-6, 9-11, 13-17, 20, 23-25 and 27 are rejected under 35 USC 102(b)<sup>2</sup>. This rejection is set forth on page 3 of the final Office Action.
- (4) Claims 7 and 21 are rejected under 35 USC 103(a) over Abe in view of Seimitsu. This rejection is set forth on page 4 of the final Office Action.
- (5) Claims 8 and 22 are rejected under 35 USC 103(a) over Abe in view of Miyoshi et al. This rejection is set forth on page 5 of the final Office Action.
- (6) Claims 12 and 26 are rejected under 35 USC 103(a) over Abe in view of Hill. This rejection is set forth on pages 5 and 6 of the final Office Action.
- (7) Claims 18 and 19 are rejected under 35 USC 103(a) over Abe in view of Chou. This rejection is set forth on page 6 of the final Office Action.

**(10) Response to argument**

At the outset, the Examiner's response in the final Office Action is incorporated herein by reference. In the following, the Examiner addresses the arguments that have not been responded.

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<sup>2</sup> The previous Examiner Julie Smith applied 35 USC 102(b). As correctly pointed out by Appellant on page 16 of the brief, since the present application was filed on February 15, 2001, thus, the rejection should have been based on 35 USC 102(a) or (e).

I. Claims 1 and 3-27 do not satisfy the written description requirement of 35 USC 112, first paragraph.

On page 8 of the brief, Appellant contended that the May 27, 2005 did not expressly indicate whether the rejection was based on the enablement or written description requirements of 35 USC 112. However, based on the Office Action on January 13, 2005, Appellant understood that it was based on the written description requirement, not the enablement requirement. The Examiner respectfully submits that Appellant's understanding is correct

First, on page 9 of the brief, Appellant argued that at no time prior to the January 13, 2005 Office Action did the Examiner asserted that Appellant's claims were *unsupported* by the original application. The Examiner respectfully submits that the instant rejection under 35 USC 112, first paragraph, is based on a lack of an adequate written description only. The Examiner did not need to assert that Appellant's claims were unsupported by the application as filed because the rejection is not based on new matter. Please note that the Form Paragraph 7.31.01 in MPEP 706.03(c) covers the inadequate description including new matter situations. In the instant case, the new matter situations are not applicable.

Second, Appellant asserted that “[b]ecause the claims do not recite how the button is movable within the recess, whether the originally filed application describes how the button is movable is irrelevant for the purposes of compliance with the written description.”

The above assertion is unsupported by substantial evidence in the record and/or is not in accordance with law. In fact, each of independent claim 1, 3, *etc.* specifically recites that the claimed operation control button is *movable within the recess*. Meanwhile, the Statute under 35 USC 112 requires:

“The specification shall contain a written description of the invention, and of the *manner* and process of making and *using* it, in such full, clear, concise, and exact terms . . .” (Emphasis added).

Simply put, since Appellant claims that the button is movable within the recess, therefore, the Statute requires Appellant to provide a full, clear, concise written description of the *manner* of which the button is movable within the recess. Appellant’s disclosure fails to satisfy the statutory description requirement as evidenced by, *e.g.*, paragraphs [0026]-[0031] of the specification and the drawings. Indeed, as expressly described in paragraph [0027] of the specification and as shown in Appellant’s Figs. 3-7, the button 40 is “press fit into the switch mounting recess 42 such that the control switch is *securely maintained* in the switch mounting recess” (Emphasis added). Consequently, the bottom surface 46 of the recess 42 acts as a stopper to stop the movement of the button 40. If the button 40 is moved downwardly within the recess 42, the button 40 would destroy the bottom surface 46 of the recess 42 and render Appellant’s device to be inoperative for its intended design. Therefore, Appellant’s specification and drawings are inconsistent with the functional statements set forth in Appellant’s claims.

Third, on page 14 of the brief, Appellant relied on the Court’s holding in *Eiselstein v. Frank*. However, the rejection in this case is based on the claims and the disclosure presented in this *current* application, *not on “a prior application.”*

Fourth, on same page 14, Appellant stated that “[o]ne of ordinary skill in the art would readily recognize that the button has to move within the recess in order to function as a switch.”

On the one hand, Appellant provides no substantial evidence to support the above statement. It is well settled that an expert’s opinion on the ultimate legal issue must be supported by something more than a conclusory statement. *In re Buchner*, 18 USPQ2d 1331, 1332 (Fed.

Cir. 1991). On the other hand, the Court has long laid Appellant's arguments to rest by pointing out that "it is not a question of whether one skilled in the art *might* be able to construct the patentee's device from the teaching of the disclosure. . . Rather, it is a question whether the application necessarily discloses that particular device." *Lockwood v. American Airlines, Inc.*, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997) and cases cited therein. "It is not sufficient for purposes of the written description requirement of 112 that the disclosure, when combined with the knowledge in the art, would lead one to *speculate* as to modifications that the inventor might have envisioned, but failed to disclose. Each application in the chain *must* describe the claimed features." (Emphasis added). *Lockwood* at 1966. Applying this rule to the instant case, Appellant's claims specifically call for the button is movable within the recess, *a fortiori*, Appellant must describe how it can move as claimed.

Fifth, in the last paragraph on page 14 of the brief, Appellant argued that the embodiments of Figs. 6 and 7 include retention rings that expressly described as restricting the movement of their respective buttons, thus, further provide support for a movable control button.

The instant contention is likewise unsupported by substantial evidence in the record. In fact, Figs. 6 and 7 show that the button 40 is directly abutted against the bottom surface 46 of the recess 42. Since the surface 46 acts as a stopper to stop the movement of the button 40, the button 40 may not move. In addition, Figs. 6 and 7 show that the retention rings 68 are abutted against the button 40, thus, the rings 68 also act as stoppers or restrictors, *i.e.*, the rings 68 prevent the upward movement of the button 40. Since the bottom surface 46 prevents the downward movement of the button 40 and since the rings 68 prevent the upward movement of the button 40, the button 40 is fixed or stationary in the recess 42. If the button 40 is movable as

Appellant alleged, Appellant should show the moved or alternate positions of the button in accordance with 37 CFR 1.84(h)(4). To the contrary, Figs. 6 and 7 show that the button 40 is fixed or stationary within the recess 42. Hence, Appellant's claims are in direct conflict with Appellant's own specification and drawings.

In summary, since the specification fails to contain a description regarding the manner of using the claimed invention, Appellant has failed to meet the requirements under 35 USC 112 as a matter of law.

II. Claims 1 and 3-27 do not satisfy the definiteness requirement of 35 USC 112, second paragraph.

On page 15 of the brief, Appellant complained that the limitation that the button is movable within the recess had been included in the pending claims for two years, yet despite having issued three substantive Office Actions and two Advisory Actions since then, the alleged "indefiniteness" was not raised until January 13, 2005.

The Board has pointed out that "[t]here is nothing unusual about an examiner changing his viewpoint as to the patentability of a claim as the prosecution progresses, and, so long as the rules of the PTO are duly complied with, appellant has no ground for complaint because of the change in view." *Ex parte Webb*, 30 USPQ2d 1064, 1067 (Bd. Pat. App. & Inter. 1993). See also footnote 4 in *In re Brown & Portillo, Inc.*, 5 USPQ2d 1381 (TTAB 1987).

On page 16 of the brief, Appellant asserted that there is no ambiguity regarding the recitation that the control button is *movable* within the recess. The Examiner respectfully submits that legal precedents have held that the optional term, such as, "movable" is vague and indefinite in the sense that things which may be done are not required to be done. In the instant case, the button is movable, but is not required structurally to be moved within the recess. See

“discardable” in *Mathis v. Hydro Air Industries*, 1 USPQ2d 1513, 1527 (D.C. Calif. 1986), “crimpable” in *Application of Collier*, 158 USPQ 266 (CCPA 1968), “removable” in *In re Burke Inc.*, 22 USPQ2d 1368, 1372 (D.C. Calif. 1992), and “comparable” in *Ex parte Anderson*, 21 USPQ2d 1241, 1249 (BPAI 1992).

Particularly, the Examiner is mindful that although the terms of a claim may appear to be definite as alleged by Appellant, inconsistency with the specification disclosure or prior art teaching may make an otherwise definite claim take on an unreasonable degree of uncertainty. MPEP 2173.03 and cases cited therein. In the case *sub judice*, the claims at issue are *imprecise* because the specification and the drawings show that the claimed button is *not* movable within the recess. Consequently, one skilled in the art would not understand the bounds of the claim when read in light of the specification. Thus, the claims do not satisfy section 112 paragraph 2 as mandated by *Exxon Research and Engineering Co.* cited by Appellant.

III. Claims 1, 3-6, 9-11, 13-17, 20, 23-25, and 27 are anticipated by Abe

On page 16 of the brief, Appellant pointed out that this application was filed on February 15, 2001, less than one year after Abe was issued, thus, Abe is not prior art under Section 102(b). However, Appellant’s heading states “The Subject Matter of Claims 1, 3-6, 9-11, 13-17, 20, 23-25, and 27 Is Not Anticipated by Abe Under 35 USC 102(a).” (Emphasis added). Therefore, Appellant *de facto* acquiesced that Abe is prior art under Section 102(a).

Appellant further asserted that Abe does not disclose or suggest each of the limitations of the rejected claims. In this vein of arguments, with respect to claim 1, Appellant relied on Abe’s Fig. 11 to contest that Abe does not include “a top surface that defines a recess having a connected bottom and sidewall.”

The Examiner respectfully submits during patent examination, the pending claims must be given their broadest reasonable interpretation consistent with the specification, however, it is impermissible to import the subject matter from the specification into the claims. MPEP 1111. “One must bear in mind that, especially in nonchemical cases, the words in a claim are generally not limited in their meaning by what is shown or disclosed in the specification.” MPEP 2111.01. In addition, it is well settled that anticipation law requires distinction be made between invention described or taught and invention claimed. It does not require that the reference “teach” what subject patent application teaches, it is only necessary that the claim under attack, as construed by the Court, “*read on*” something disclosed in the reference, i.e., all limitations of the claim are found in reference, or are “*fully met*” by it. *Kalman v. Kimberly Clark Corp.*, 218 USPQ 781, 789 (CAFC 1983).

Returning to this case, claim 1 recites “*a bicycle control device having a top surface, the top surface defining a recess therein, the recess having a bottom wall and a side wall connected to the bottom wall.*” Meanwhile, Abe teaches in Fig. 11 the control switch unit that has the top surface which is the top surface of the casing 38. The top surface in turn defines the recess (unnumbered) that has the bottom wall and the sidewall connected to the bottom wall as seen in the Attachment 1. In fact, Fig. 11 of Abe is strikingly similar to Appellant’s Fig. 3 wherein Appellant’s adhesive layer 60 is similar to Abe’s layer 32. Appellant’s contention that the top surface of the casing does not define a recess as claimed is unsupported by the substantial evidence presented in Fig. 11 of Abe. The button 35a/54 is transparently movable within the recess as described in col. 6, lines 53-64. Therefore, claim 1 is “*fully met*” by Abe.

IV. Claims 7 and 21 are obvious under 35 USC 103 over Abe in view of Seimitsu

On page 18 of the brief, Appellant alleged that the rejection is improper since Seimitsu is non-analogous art and there is no motivation or suggestion to combine Abe with Seimitsu. Appellant further admitted that “[i]n order to rely on a reference as a basis for rejection if the applicant’s invention, the reference must be . . . reasonably pertinent to the particular problem with which the inventor was concerned.” *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992).

In this case, claim 7 (or 21) recites “the control switch is attached in the switch mounting recess by an adhesive.” Therefore, the attachment of the switch and the recess is the particular problem. On the other hand, Appellant or Abe was concerned with the problem to attach or mount the button to the recess. See Abe, col. 5, line 56 through col. 6, line 64. In the same token, Seimitsu was concerned with the problem to attach or mount the vibration insulating members 21 to a fixing base body 10. See the translation attached. Since Seimitsu was concerned with the particular problem of attaching or mounting two members together in the same manner as Appellant or Abe, thus, Seimitsu is reasonably pertinent to the particular problem with which Appellant or Abe was dealt with. The combination Seimitsu and Abe is proper as mandated by *Oetiker*.

The Court recently reiterated that “[p]recedent has also recognized that ‘[t]he suggestion or motivation to combine references does not have to be stated expressly; rather it may be shown by reference to the prior art itself, to the nature of the problem solved by the claimed invention, or to the knowledge of one of ordinary skill in the art.’” *In re Johnston*, 77 USPQ2d 1788 (Fed. Cir. 2006). Moreover, “as long as some motivation or suggestion to combine the references is provided by the prior art taken as a whole, the law does *not* require that the references be

combined for the reasons contemplated by the inventor.” *In re Kahn*, 78 USPQ2d 1329 (Fed. Cir. 2006).

In the case at hand, on the one hand, Appellant, Abe, and Seimitsu faced the same problem of attaching two members together. Seimitsu teaches one method of attaching by adhesion. Thus, Seimitsu is pertinent to the problem faced by Appellant or Abe. On the other hand, the use of adhesion to attach two members together is notoriously well known as evidenced, *e.g.*, by the fact that the students at kindergartens or elementary schools frequently use the glue to attach their art works together. Thus, even if the Examiner did not combine Abe with Seimitsu, claims 7 and 21 still should be rejected under 35 USC 103 based on the knowledge of one of ordinary skill in the art as mandated by *Johnston*.

On page 20, Appellant asserted that “[i]f the prior art had in fact disclosed the desirability of using an adhesive to attach a control switch in a switch mounting recess, Abe should have made use of the technique as well.”

Contrary to Appellant’s remarks, Abe expressly describes, *e.g.*, in col. 6, lines 21 and 22, that “[t]he joints of the protrusion 81 and groove 41 are then integrally fused by ultrasonic fusion.” See also Abe, col. 5, lines 56-59. The ultrasonic fusion broadly includes the adhesion. Therefore, Abe implicitly does suggest the use of the adhesion via the ultrasonic fusion.

**V. Claims 8 and 22 are obvious under 35 USC 103(a) over Abe in view of Miyoshi**

On page 20 of the brief, using the same line of arguments, Appellant criticized that Abe and Miyoshi does not teach or suggest the claimed “attachment arm.”

First, claim 8 (or 22) recites “the operation control button having an attachment arm made of an elastic material, wherein the attachment arm is press fitted into the hole of the switch mounting recess.”

Appellant relied on an *ipssismis verbis* test that requires the prior art to use the same terminology as the one of Appellant. See footnote 11 in *AKZO N.V. v. International Trade Commission*, 1 USPQ2d 1241, 1245 (CAFC 1986). It is well settled that the inventor is entitled to be his/her own lexicographer. Thus, Miyoshi does not need to use the term “an attachment arm” in order to read on Appellant’s claimed arm. In this case, the Examiner interpreted that Miyoshi teaches the recess defining a hole 9a,b therein, the control switch 12 having an attachment arm 13 made of an elastic material, wherein the arm 13 is press-fitted into the hole of the recess. This interpretation is reasonable because, as seen in the translation attached, page 4, Miyoshi’s element 13 is a spring. Meanwhile, *Webster’s II New Riverside University Dictionary*, 1994, defines the spring as “an elastic device, as a coil of wire, that regains its original shape after being compressed or extended” or “elasticity: resilience.” Appellant’s contention that “nothing in the reference indicates that spring 13 is elastic” on page 21 of the brief is in direct conflict with ordinary and customary meaning of the term “spring” as defined by standard dictionary. It is well settled that the reference needs not provide an explanation to anticipate when the artisan would know as evidenced by standard textbook. *In re Opprech*t, 12 USPQ2d 1235 (Fed. Cir. 1989). However, in this case, Appellant required that the reference has to explicitly indicate that the spring is elastic.

Appellant further alleged that the spring is not described as performing any attachment function and cannot fairly be characterized as “an attachment arm.”

The Court has long held that obviousness question cannot be approached on basis that skilled artisans would only know what they read in references; such artisans must be presumed to know something about the art apart from what the references disclose. *In re Jacoby*, 309 F.2d 513, 516, 135 USPQ 317, 319 (CCPA 1962). Moreover, conclusion of obviousness may be made “from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference. *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

In this case, Fig. 2 of Miyoshi shows that the spring 13 is: (a) attached to the button 12; (b) made of an elastic material; and (c) is press fitted into the hole (unnumbered in Fig. 2. See Attachment 2) of the switch mounting recess (Att. 2) as described on page 4 of the translation. Appellant argued on page 21 of the brief that “[t]here is no recess having a bottom wall that defines a hole.” However, this argument is likewise unsupported by substantial evidence. Appellant overlooked the fact that Figs. 2-4 of Miyoshi show that: (a) the spring/arm 13 is fitted into the hole (Att. 2) as seen by the assembly lines in Fig. 2; and (b) the cover 8 in turn is connected to the base 7 as seen in Fig. 3 or 4. Therefore, the bottom wall of the base 7 is the bottom wall of the hole of the switch mounting recess. The hole/recess as shown in Att. 2 conforms to the shape of the shaft of the button 12 so that the button 12 can be assembled to the hole as evidenced by the assembly lines in Fig. 2. Put in another fashion, Miyoshi teaches or suggests the limitation “the operation control button having an attachment arm made of an elastic material, wherein the attachment arm is press fitted into the hole of the switch mounting recess” in claim 8 or 22 via Figs. 2-4.

VI. Claims 12 and 26 are obvious under 35 USC 103 over Abe in view of Hill

On pages 23 and 24 of the brief, Appellant again relied on the arguments that Hill is not analogous art and there is no suggestion to combine.

However, Hill teaches an electrostatic transducer for many industrial applications, such as, flow metering, pipeline inspection, automated welding, and *vehicle guidance*. See col. 1, lines 61-67 of Hill's Background of Invention. The bicycle is a vehicle based on its ordinary and customary meaning. Therefore, Hill broadly teaches that his transducer can be used as a bicycle control device. As such, Appellant's contention that Hill is non-analogous art lacks proper foundation in the record.

Notwithstanding this fact, claim 12 or 26 recites "the retention ring is threadingly engaged with the switch mounting recess." Appellant asserted that the Examiner has failed to show a motivation or suggestion to combine Hill with Abe. Contrary to Appellant's arguments, Hill is concerned about the particular problem of attaching the member 17 to the recess 32 by the retention ring 16. Similarly, Appellant is concerned about the problem of attaching the switch to the mounting recess via the retention ring. Hence, Hill is "reasonably pertinent" to the particular problem of attaching the switch/transducer to a bicycle/vehicle control device as required by *Oetiker, Johnston, and Kahn* *supra*.

VII. Claims 18 and 19 are obvious under 35 USC 103 over Abe in view of Chou

Appellant averred that Abe does not teach the handlebar assembly comprising a bicycle control device that has a top surface defining a switch mounting recess therein, the recess having bottom and side walls. This contention is unsupported by Figs. 1 and 11 of Abe as explained above.

Appellant further alleged that Chou does not disclose the claimed relationship between an operation control button and a switch mounting recess formed in a bicycle control device's top surface.

Note that claim 18 recites "a cycle computer attached to the handlebar, *separate* from the bicycle control device." (Emphasis added). The Examiner respectfully submits that Chou intended to attach the cycle computer 1, 2 to the handlebar 80, 81 *separate* or spaced apart from the operation control button 5 so that the biker can see the computer and control the button/control device easily without moving the hand from the handle grip. *Ibid.* col. 1, lines 6-13 and lines 34-55. Chou's intended design is the claimed relationship mentioned above. Hindsight is eliminated in this instant since Appellant, Abe, and Chou are not only in the same field of endeavor (bicycle control), but also solve the same problem (difficulty in operating the control button and seeing the computer/meter at the same time) by substantially the same way (separating the control button and the computer/meter and connecting them by cable).

#### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the Examiner in the Related Appeals and Interferences section of this Examiner's answer.

### **CONCLUSION**

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



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Primary Examiner

Conferees on June 8, 2006

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Primary Examiner Kim Chong

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# **ATTACHMENT 1**

FIG. 10

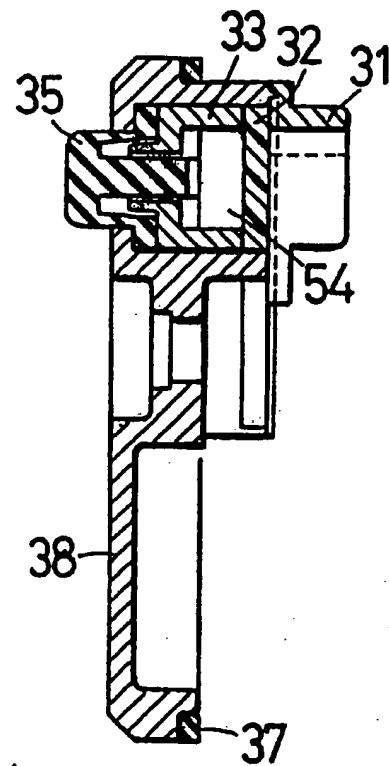
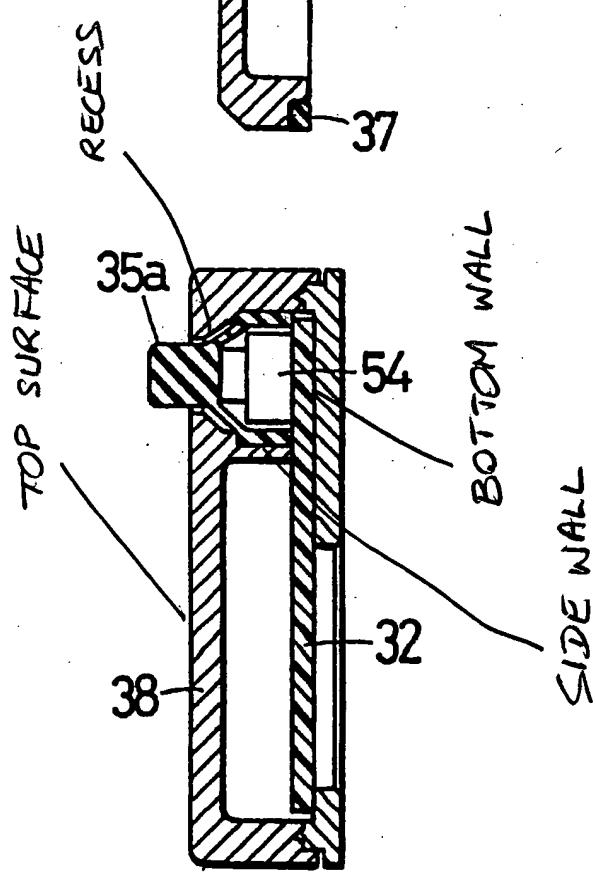
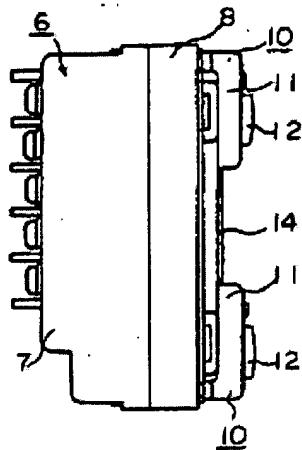


FIG. 11



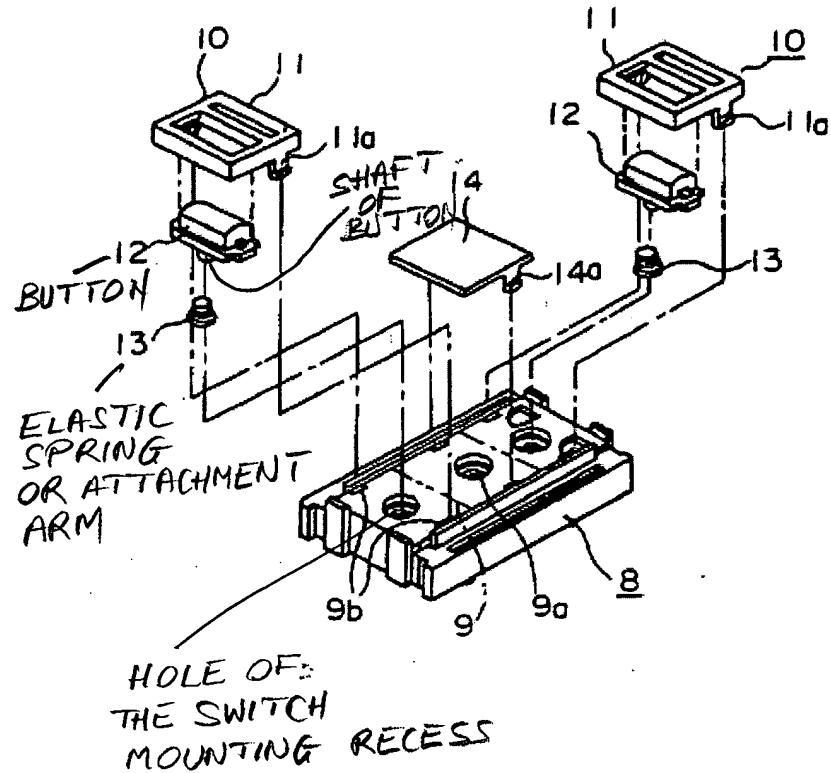
## **ATTACHMENT 2**

FIG 1



6: Case  
10: Operating Body  
14: Plank Cover

FIG 2



# APPENDIX

PTO 06-4991

CY=JA DATE=20000929  
PN=12-268953

ELECTROLUMINESCENCE PACKAGING STRUCTURE  
[Erekutororuminessensu no toritsuke kouzou]

Mitsuo Iwamura

UNITED STATES PATENT AND TRADEMARK OFFICE  
Washington, D.C. June 2006

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INVENTOR (72) : IWAMURA, MITSUO

APPLICANT (71) : KAWAGUCHIKO SEIMITSU K.K.

TITLE (54) : ELECTROLUMINESCENCE PACKAGING STRUCTURE

FOREIGN TITLE (54A) : EREKUTORORUMINESSENSU NO TORITSUKE KOUZOU

[Claim]

[Claim 1] An electroluminescence packaging structure characterized by: retaining the edge parts of electroluminescence, which was formed by sequentially layering a transparent electrode, a light-emitting layer, a dielectric layer, and a backplate under the bottom side of a transparent substrate and by covering them with an insulating film, by means of "コ"-shaped vibration insulating members; and by adhering and fixing at least one of the top sides or bottom sides of said vibration insulating members to a fixing base body by means of an adhesive.

[Detailed Explanation of the Invention]

[0001] [Technical Field of the Invention]

The present invention relates to an electroluminescence mounting structure which prevents noises in an electronic apparatus equipped with electroluminescence.

[0002] [Related Art]

Electroluminescence (hereafter referred to as EL) is employed for backlights that are used as nighttime illuminations for liquid-crystal panels of electronic appliances such as portable clocks and cell phones. In general, this EL has the structure illustrated in Figure 5. In other words, in the structure of the EL [1], a transparent electrode [3], a light-emitting layer [4], a dielectric layer [5], and a backplate [6] are layered in that order under the bottom face of a transparent substrate [2], and these are covered by an insulating film [7]. Moreover, although not illustrated, parts of the transparent electrode [3] and backplate [6] are extended to the outer rim, and these extended end parts are provided

with terminals for voltage application.

[0003] As the transparent substrate [2] making up the above EL [1], a material such as glass, a PET (polyethylene terephthalate) film, etc. that has excellent transparency, insulation properties, humidity resistance, etc. is utilized. Moreover, the transparent electrode [3] is formed by vacuum-depositing ITO (indium tin oxide) powder obtained by doping indium oxide ( $In_2O_3$ ) with tin oxide ( $SnO_2$ ). Moreover, a light-emitting layer [4] is formed by dispersing light-emitting powder, which is obtained by doping zinc sulfate ( $ZnS$ ) that acts as a light-emitting base material with a small amount of an activating agent (metal or halogen element), into a high dielectric resin binder, such as a cyano resin compound, and by then applying a printing method, etc. Moreover, the dielectric layer [5] is formed by dispersing a high dielectric metal, such as barium titanate, into a high dielectric resin binder and by then applying a printing method. This dielectric layer [5] also has a reflecting function because of the barium titanate. Moreover, the backplate [6] is formed by turning silver powder or graphite powder into a paste and by then applying a printing method. Furthermore, the insulating film [7] is formed from a resin, such as a fluorocarbon resin, that has excellent humidity resistance and insulating properties by means of printing or is formed by bonding a resin film with the transparent substrate [2] by means of thermocompression.

[0004] When a predetermined AC voltage is applied to the transparent electrode [3] and backplate [6] of the thus-formed EL [1] through the application terminal equipped at the extended end parts, the

light-emitting layer [4] emits light, which becomes radiated to the exterior through the transparent electrode [3] and transparent substrate [2] and illuminates the surrounding area brightly.

[0005] Moreover, one of the conventional structures, in which an EL having the above structure is used as the backlight of a liquid-crystal panel, is illustrated in Figure 6. In other words, according to this structure, the liquid-crystal panel [8] is fixated to a retaining frame [9], and the EL [1] placed on the lower-face side of the liquid-crystal panel [8] is fixated to a fixing base body [10] by means of an adhesive [11]. In this case, the retaining frame [9] is formed from a relatively rigid material such as a metal plate or plastic plate and is integrally attached to the chassis, printed circuit board, etc. of the electronic apparatus. As the fixing base body [10], the printed circuit board or a metal plate provided specifically for fixation is utilized.

[0006] Based on the above structure, the light emitted by the EL [1] illuminates the liquid-crystal panel above it and thus brightly lights up the display in the dark during nighttime, etc.

[0007] However, vibrations occur when the EL [1] emits light and become transmitted to the fixing base body [10] and then further to the periphery components that are in contact with the fixing base body [10]. As a result, a resonance phenomenon occurs and appears as vibration noises. In a cell phone, in particular, it appears as noises that interfere with conversations.

[0008] As a method for solving this noise problem, there is the technique disclosed in Kokai No.10-215085. According to this structure

illustrated in Figure 7, an EL [1] is fixated by the edges of the bottom face of the EL [1] being adhered to a fixating base body, which is a printed circuit board [10], by means of a rectangular-frame-shaped sponge foam [12] equipped with both-sided tapes [12a], and a liquid-crystal panel [8] is fixated above the EL [1] by using a retaining frame [9] attached to the printed circuit board [10].

[0009] In this case, the sponge foam [12] is utilized as a vibration insulator that inhibits vibrations, and it dampens the vibrations transmitted to the printed circuit board [10] by absorbing the vibrations of the EL [1]. In this manner, the effect of inhibiting noises is achieved.

[0010] [Problems that the Invention is to Solve]

However, in order to realize such a structure, the vibration insulator, which is the sponge foam, needs to be disposed on the side on which the fixing base body is fixated. Therefore, the vibration insulator's installation direction must be distinguished based on whether the EL is fixated at the top side or bottom side. Moreover, the shape of the vibration insulator needs to be changed in some cases. Furthermore, it costs to shape the sponge foam into a rectangular frame, and the shape must be made to match the size of the EL if the size is altered. Moreover, if the EL needs to be replaced during repair, etc., the vibration insulator must be peeled off, which makes repairing troublesome.

[0011] [Means for Solving the Problems]

The present invention was completed in light of the above problems, and its purpose is to supply a structure in which the EL can be optionally fixated at either one of the top side or bottom side by means of a single

type of vibration insulating members. In order to achieve this purpose, the present invention is characterized by: forming an electroluminescence by sequentially layering a transparent electrode, a light-emitting layer, a dielectric layer, and a backplate under the bottom side of a transparent substrate and by covering them with an insulating film; retaining the edge parts of said electroluminescence by means of  $\square$ -shaped vibration insulating members; and by adhering and fixing at least one of the top sides or bottom sides of said vibration insulating members to a fixing base body by means of an adhesive.

[0012] [Embodiment of the Invention]

An EL packaging structure of the invention will be explained based on the following drawings. Figures 1 ~ 2 illustrate the EL packaging structure of a first embodiment of the invention. Figure 1 is its cross-sectional drawing, and Figure 2 is a plane view of the EL of Figure 1 viewed from the top. Moreover, members in the drawing identical to those of the related art have been assigned the same reference numerals.

[0013] According to the EL packaging structure of this embodiment shown in Figure 1, an EL [1] is sandwiched and fixated by  $\square$ -shaped vibration insulating members [21] which are provided in an opposing manner in the drawing. Moreover, the bottom faces [21b] of the opposing vibration insulating members [21] are adhered and fixated to a fixing base body [10].

[0014] The vibration insulating members [21] have the shapes of  $\square$ , and the EL [1] is retained by the edge parts [1b] of the EL [1] being

locked with the depressed spaces [21a] of the  $\supset$  shapes. Moreover, these vibration insulating members [21] have certain lengths and retain the edge parts [1b] of the four sides of the EL [1], which is roughly rectangular. For these vibration insulating members [21], a soft material such as rubber or a resin is selected, and they absorb the vibrations of the EL [1] and inhibit the transmission of vibrations to the fixing base body [10]. Soft silicon rubber is utilized in this embodiment. A projection part [1a] provided at a portion of the edges of the roughly rectangular EL [1] is a terminal attaching part, to which a voltage application terminal is equipped, and it is preferred that the vibration insulating members [21] be provided in a manner such that they retain the edge parts of the four sides as widely as possible except for the terminal attaching part.

[0015] Next, although a printed circuit board is utilized directly as the fixing base body [10] in this embodiment, it is not particularly specified and may instead be a relatively rigid metal sheet.

[0016] In the above structure, light emitted from the EL [1] becomes transmitted through a liquid-crystal cell [8] above it and illuminates the display of the liquid-crystal cell [8].

[0017] Moreover, vibrations generated from the EL [1] become absorbed by the soft vibration insulating members [21], and the transmission of vibrations to the fixing base body [10] is suppressed as a result. Thus, generation of noise is prevented.

[0018] Moreover, since the EL [1] can be attached by simply being inserted into the depressed parts [21a] on the inner sides of the  $\supset$ -shaped vibration insulating members [21], which are attached to the fixing base

body [10] along the four sides of the EL [1], its attachment and removal can be performed with ease and replacing it during repair, etc. is almost trouble-free.

[0019] Moreover, since the edge parts [1a] on the four sides of the EL [1] are retained by  $\square$ -shaped vibration insulating members [21], a spatial gap [23] is created automatically between the EL [1] and the fixing base body [10], and the air layer of this spatial gap [23] also acts to suppress the transmission of the vibrations of the EL [1]. This creates another noise preventing effect.

[0020] Moreover, even if the size of the EL [1] is altered, it is only required to adjust the lengths of the  $\square$ -shaped vibration insulating members [21] in accordance with the size of the EL [1]. Since they can be easily cut into desired lengths, only one type of vibration insulating members is necessary. Therefore, it is not necessary to prepare different vibration insulating members for different sizes of EL as in the past, and the cost can therefore be low.

[0021] Moreover, the EL [1] is roughly a rectangle in this embodiment, but a round-shaped one can be applied in the same manner. If the shape is circular, a vibration insulating member is formed in a round ring shape and is provided with a depressed  $\square$ -shaped part on its inner-diameter side. This ring-shaped vibration insulating member should be used after being divided into 2 or 3 sections.

[0022] Next, Figure 3 is a cross-sectional drawing of an EL packaging structure pertaining to a second embodiment of the invention. In this embodiment, the lower face of a liquid-crystal panel [8] fixated to a

retaining frame [9] are adhered and fixated to the upper faces [21c] of the opposing  $\square$ -shaped vibration insulating members [21] by means of an adhesive [22], and the edge parts [1b] of an EL [1] is inserted into the depressed parts [21a] on the inner sides of the  $\square$  shapes of the opposing vibration insulating members [21].

[0023] In this embodiment, the EL [1] is packaged by the upper faces [21c] of the  $\square$ -shaped vibration insulating members [21] being directly adhered to the lower faces of the liquid-crystal panel [8]. In this case, the liquid-crystal panel [8] is used as both a display and a fixing base body.

[0024] In this manner, combined with the above-described first embodiment, the EL can be packaged by means of the adhesion and fixation of both upper and lower sides of a single type of  $\square$ -shaped vibration insulating members. Therefore, the EL can be packaged by means of a single type of vibration insulating members regardless of the packaging direction of the EL. Therefore, there is also an advantage in terms of cost.

[0025] Moreover, by employing a structure in which the EL is sandwiched by  $\square$ -shaped vibration insulating members, vibrations of the EL are absorbed and thus prevented from being transmitted to the fixing base body. Not only that, a certain spatial gap is created between the EL and the fixing base body, and the air layer in this spatial gap inhibits the vibrations of the EL. These two effects correlatively amplify the effect of noise prevention.

[0026] Next, Figure 4 is a cross-sectional drawing showing an EL structure of a third embodiment. In this embodiment, an EL [1] is sandwiched by opposing  $\square$ -shaped vibration insulating members [21]. The lower faces [21b] of the vibration insulating members [21] are adhered and fixated to a fixing base body [10] by means of an adhesive [22], and the upper faces [21c] of the vibration members [21] are adhered and fixated to a liquid-crystal panel [8] by means of the adhesive [22].

[0027] As described earlier, the above packaging structure can be employed by utilizing  $\square$ -shaped vibration insulating members, and conventionally used retaining frames for liquid-crystal panels become unnecessary. This also has a cost reducing effect.

[0028] As described earlier, by employing a structure in which an EL is sandwiched by  $\square$ -shaped vibration insulating members, the EL can be attached to either of the upper side or lower side of the fixing base body by means of a single-type of vibration insulating members. Therefore, vibrations of the EL are suppressed, and a noise preventing effect is achieved. Moreover, the same vibration insulating effect can be achieved by fixating the EL to the depressed parts of the vibration insulating members by means of an adhesive instead.

#### [0029] [Effects of the Invention]

As explained in detail earlier, by sandwiching an EL by means of  $\square$ -shaped vibration insulating members as in the structure of this invention, it becomes possible to attach the EL to either one of the upper side or lower side of the fixing base body by means of a single type of

vibration insulating members.

[0030] Moreover, by employing a structure in which an EL is sandwiched by  $\square$ -shaped vibration insulating members, vibrations can be suppressed by the vibration insulating members. Not only that, a spatial gap is automatically created between the EL and the fixing base body, and the air layer in the spatial gap also inhibits vibrations. Therefore, the noise preventing effect can be amplified.

[0031] Moreover, when  $\square$ -shaped vibration insulating members are utilized, the EL can be attached by being simply inserted into the depressed parts of the  $\square$  shapes. Therefore, it can be attached and detached swiftly with ease.

[0032] Moreover, when using a rectangular-shaped EL, the vibration insulating members can be used after having their lengths adjusted by being severed. Therefore, only one type of vibration insulating members is necessary, and there is no need to prepare various types of them to match the size of the EL. This reduces the cost as a result.

[Brief Explanation of the Drawings]

[Figure 1] A cross-sectional drawing showing the EL packaging structure of a first embodiment of the invention.

[Figure 2] A plane view of the EL of Figure 1 viewed from the top.

[Figure 3] A cross-sectional drawing showing the EL packaging structure of a second embodiment of the invention.

[Figure 4] A cross-sectional drawing showing the EL packaging structure of a third embodiment of the invention.

[Figure 5] A cross-sectional drawing showing an EL structure.

[Figure 6] A cross-sectional drawing showing a packaging structure of EL utilized as the backlight of a conventional liquid-crystal panel.

[Figure 7] A cross-sectional drawing showing a conventional EL packaging structure for noise prevention.

[Explanation of the Reference Numerals]

[1] = EL

[1b] = edge part

[2] = transparent substrate

[3] = transparent electrode

[4] = light-emitting layer

[5] = dielectric layer

[6] = backplate

[7] = insulating film

[10] = fixing base body

[21] =  $\square$ -shaped vibration insulating member

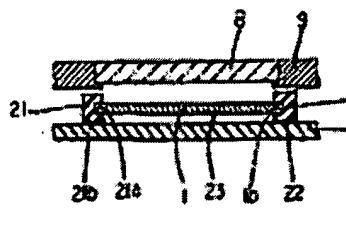
[21a] = depressed part

[21b] = lower face

[21c] = upper face

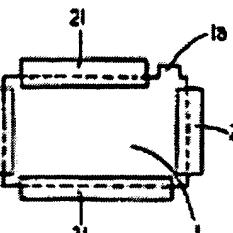
[22] = adhesive

[Figure 1]

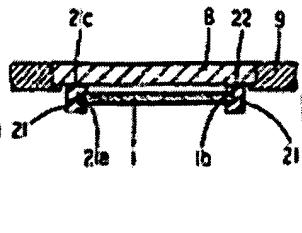


1 EL	21 防振部材
1b 固定部	21a 凹部
8 液晶パネル	21b 下面
9 保持枠	22接着用
10 固定基体	23 空気隙

[Figure 2]



[Figure 3]



[Figure 5]

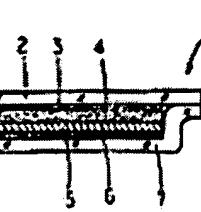


Figure 7

Figure 4

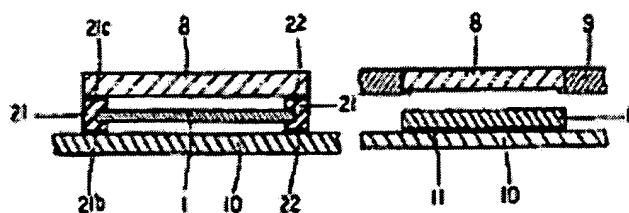
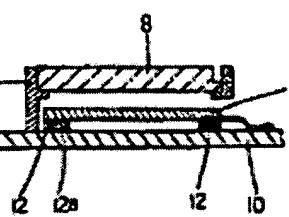


Figure 6



[1] = EL; [1b] = edge part; [8] = liquid-crystal panel; [9] = retaining frame; [10] = fixing base body; [21] =  $\Box$ -shaped vibration insulating member; [21a] = depressed part; [21b] = lower face; [22] = adhesive; [23] = spatial gap.

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SWITCH DEVICE  
[Suichi sochi]

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## Specification

### 1. Title of the Invention

SWITCH DEVICE

### 2. Claims

A switch device, wherein the switch device accommodates a switch main body, wherein at least one of a plurality of mounting portions attached to the outer periphery is furnished with a case to which an operating body is attached for operating the switch main body, and wherein a plank cover is furnished for covering the empty mounting portions or the mounting portions other than the ones to which an operating body has been attached.

### 3. Detailed Description of the Invention

#### (Industrial Field of Application)

The present invention relates to a switch device and, more specifically, to a switch device in which a plurality of mounting portions for attaching the operating body are furnished with a case.

#### (Prior Art)

FIG 5 is a switch device of the prior art disclosed in Design No. 575079, and FIG 6 is a cross-sectional view from IV-IV in FIG 5.

#### (Problem to be Solved by the Invention)

In these drawings, (1) is a case consisting of a base (2) and a cover (3) for accommodating the switch main device (not shown). Three button insertion holes (3a) are formed in the cover (3). (4) is a push button exposed to the outside from a button insertion hole (3a), and (5) is a mounting fixture.

A switch device of the prior art is embedded in a wall, and push buttons (4) are pressed to operate the switch main body.

If, for example, there are only two push buttons (4) in a switch device of the prior art, one of the button insertion holes (3a) is empty and this detracts from the external appearance. A different type of case (1) has to be made based on the number of push buttons (4) and this increases costs.

The purpose of the present invention is to provide a switch device that solves this problem by providing a switch device that reduces costs by using the same case regardless of the number of operating bodies without detracting from the external appearance.

(Means of Solving the Problem)

In the switch device of the present invention, the empty mounting portions without an operating body attached are covered by a plank cover.

(Operation)

By covering the empty mounting portions with a plank cover, a common case can be used regardless of how many mounting bodies are attached to mounting portions.

(Working Examples)

The following is an explanation of working examples of the present invention with reference to the drawings. FIG 1 is a side view of a working example of the present invention. FIG 2 is an exploded perspective view of part of FIG 1.

In these drawings, (6) is a cover consisting of a base (7) and a cover (8) for accommodating a switch main body (not shown). Three mounting portions (9) demarcated by the dotted lines in FIG 2 are formed in the outer periphery of the cover (8), and each one of these mounting portions (9) has a through-hole (9a) and an engaging hole (9b).

Here, (10) denotes two switching bodies used to operate the switch main body attached to two mounting portions (9). A switching body (9) consists of a top cover (11), button (12) and spring (13). A protrusion (11a) on the top cover (11) fits into the engagement hole (9b). A flat plank cover (14) is attached to the mounting portion (9) in the middle without an operating body (10) attached. The plank cover (14) has a plank cover protrusion (14a) identical to the protrusion (11a) in the top cover (11). It is fitted into the engagement hole (9b) same as the operating body (10).

In this switch device, there are three mounting portions (9). Because only two operating bodies (10) are used, a plank cover (14) with a plank cover protrusion (14a) is attached to the empty mounting portion (9). As a result, the empty mounting portion does not detract from the external appearance and the case (6) can be used as is.

If three operating bodies (10) are to be used as shown in FIG 3, another operating body (10) is added instead of the plank cover (14) in FIG 1. If only one operating body (10) is mounted, two plank covers (14) are used as shown in FIG 4.

By covering empty mounting portions (9) with plank covers (14), the same case (6) can be used regardless of the number of operating bodies (10) in the mounting portions (9). This reduces costs.

In the working examples, the case (6) had three mounting portions (9). However, any number of mounting portions (9) can be used provided there are at least two. In the same working examples, three mounting portions (9) were lined up in a row. However, the mounting portions can also be arranged differently.

The shape and mounting method for the plank cover (14) are not limited to the working examples.

The switch device in the working examples used push button switches. However, another type of switch device such as one with changeover switches can be used on the present invention. The operating bodies (10) are also not limited to the configuration shown in the working examples.

#### (Effect of the Invention)

[18] Because the empty mounting portions not containing operating bodies are covered by plank covers in the switch device of the present invention, the same case can be used regardless of the number of operating bodies without detracting from the external appearance and manufacturing costs can be reduced.

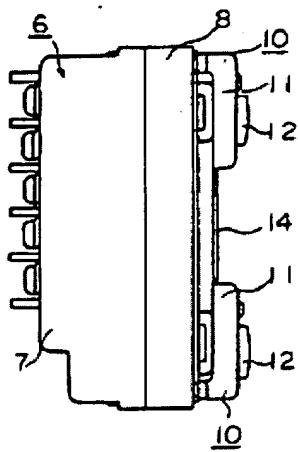
#### 4. Brief Explanation of the Drawings

FIG 1 is a side view of a working example of the present invention. FIG 2 is an exploded perspective view of part of FIG 1. FIG 3 is a side view of another working example of the present

invention. FIG 4 is a side view of yet another working example of the present invention. FIG 5 is a front view of an example of the prior art. FIG 6 is a cross-sectional view from VI-VI in FIG 5.

In the drawings, (6) is a case, (9) is a mounting portion, (10) is an operating body, and (14) is a plank cover. Identical components are denoted by the same numbers in the drawings.

FIG 1



6: Case

10: Operating Body

14: Plank Cover

FIG 2

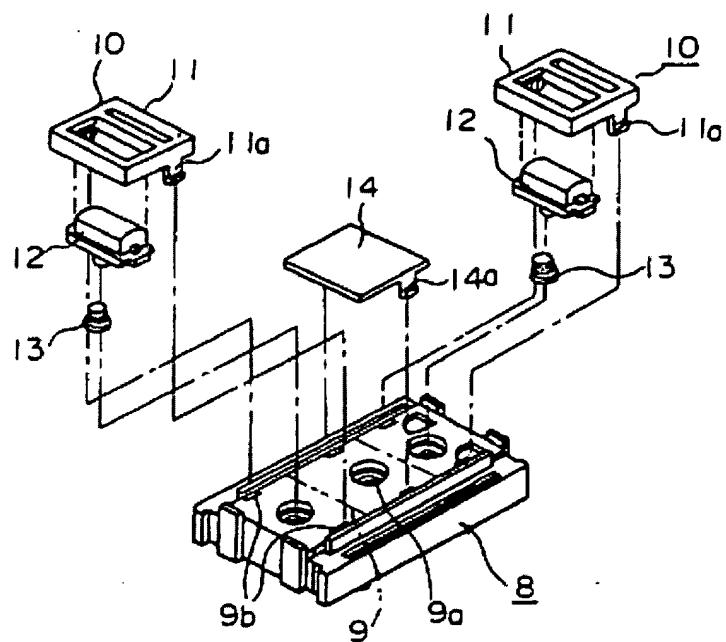


FIG 3

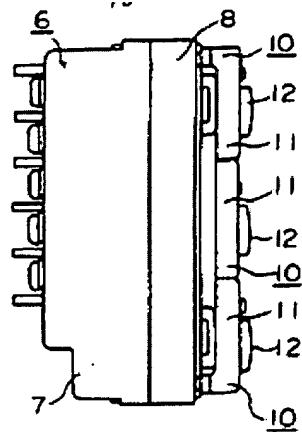


FIG 4

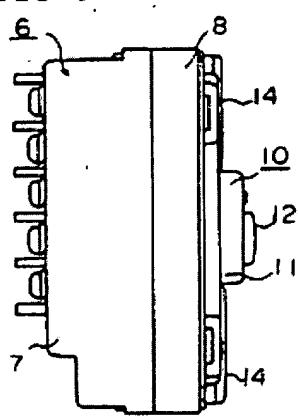


FIG 5

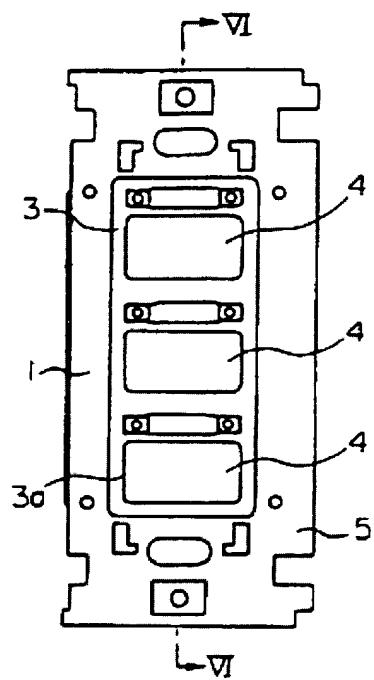


FIG 6

